

REMARKS

Entry of the foregoing and favorable reconsideration and reexamination of the subject application pursuant to and consistent with 37 C.F.R. Section 1.112, and in light of the remarks which follow, are respectfully requested. This communication is in response to the non-final official action mailed on October 18, 2007. Claims 1 - 4 have been withdrawn. Thus, claims 5-9 are pending.

Foremost, the Examiner has objected to the abstract as containing extraneous information, namely a "computer file name." *Office Action*, page 2. Applicants have corrected this informality by deleting the reference to the computer file name from the abstract. Accordingly, this objection should be withdrawn.

The Examiner has rejected claims 5 - 9 under 35 U.S.C. §103(a) as being allegedly unpatentable over *Iida* (United States Patent 6,638,485). The Examiner believes that "*Iida* discloses a method for removing [Mercury from] exhaust gas comprising adding a mercury chlorinating agent and ammonia to exhaust gas to convert the mercury to mercury chloride, passing [the exhaust gas] to a NO<sub>x</sub>/ammonia reactor, and passing [the exhaust gas] through a scrubbing tower." *Office Action*, page 3. Moreover, the Examiner believes "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to oxidize mercury on the downstream side of ammonia [de]composition because the reaction of mercury chloride and SO<sub>x</sub> is disclosed as being at the end of the process..." *Office Action*, page 3. Applicants respectfully traverse this rejection.

*Iida* teaches a process for treating a mercury-containing exhaust gas. Specifically, *Iida* employs ammonia (NH<sub>3</sub>) as a reducing agent to reduce nitrates (NO<sub>x</sub>) in mercury-containing exhaust gas to diatomic nitrogen (N<sub>2</sub>). *Iida*, Col.3, ll.38-41. *Iida* also employs HCl, in the presence of a

catalyst, to oxidize the mercury (Hg) in the exhaust gas, to  $\text{HgCl}_2$  or  $\text{HgCl}$ . Col.3, 11.50-53. Both the ammonia and  $\text{HCl}$  are injected into the same exhaust gas stream and allowed to react with the respective target components in a 'reduction denitrating unit.' Col.4, 11.17-32. According to this process, " $\text{NO}_x$  in the exhaust gas[,] into which ammonia and  $\text{HCl}$  are injected[,] reacts with the ammonia [to form  $\text{N}_2$ ,] and metal Hg is oxidized to  $\text{HgCl}_2$  in the presence of  $\text{HCl}$  in the 'reduction denitrating unit' at the same time." Col.4, 11.20-28, emphasis added. Accordingly, reaction between  $\text{NH}_3$  and  $\text{NO}_x$  occurs simultaneously, and in the same reactor (the 'reduction denitrating unit'), with the reaction between  $\text{HCl}$  and Hg.

First, *Iida* does not teach all of the limitations of the claimed invention. ("[T]he prior art reference must teach or suggest all of the claim limitations." MPEP 2143, introductory paragraph). Unlike *Iida*, the claimed invention employs an ammonia decomposition step between the  $\text{NO}_x$  reduction and Hg oxidation steps to prevent hinderance of Hg oxidation by ammonia, as shown in the following schematic (the arrows indicating exhaust gas flow):

[ $\text{NO}_x$  reduction/denitrification]

↓

[ $\text{NH}_3$  decomposition]

↓

[Hg oxidation]

↓

[wet desulfurization]

*Iida* provides no disclosure of any ammonia decomposition step whatsoever, and certainly no teaching of the importance of performing an ammonia decomposition step between denitrification and oxidation. Nor does *Iida* suggest that

incorporation of an ammonia decomposition step would provide predictable results when combined with a method of oxidizing mercury. Therefore, because *Iida* does not disclose an ammonia decomposition step, a *prima facie* case of obviousness has not been established. Accordingly, the rejection should be withdrawn.

Moreover, the claimed invention teaches away from the simultaneous reduction and oxidation disclosed in *Iida*. Instead, reductive denitration in the claimed invention occurs upstream and in a separate process from the oxidation of mercury. As already discussed, the two processes are separated by an ammonia decomposition step. There is no disclosure in *Iida* that the reduction and oxidation steps can be separated or that it would be desirable to do so. Furthermore, because *Iida* teaches simultaneous reduction and oxidation, one skilled in the art would not have been motivated to oxidize mercury on the downstream side of ammonia decomposition, as suggested by the Patent Office. Accordingly, the claimed invention and *Iida* teach two different processes of treating exhaust gases. As such, the rejection should be withdrawn.

As it is believed that all of the rejections set forth in the Official Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that he/she telephone applicant's attorney at (908) 654-5000 in order to overcome any additional objections which he might have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

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Respectfully submitted,

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